Irritable bowel syndrome

Lorraine Thom1, Pranusha Naicker2, Natalie Schellack3

1 Senior Lecturer, Department of Pharmacy, Sefako Makgatho Health Sciences University
2 Community Service Pharmacist at Madibeng Sub-district Pharmacy
3 Associate Professor, Department of Pharmacy, Faculty of Health Sciences, Sefako Makgatho Health Sciences University

Correspondence to: Prof Natalie Schellack, e-mail: natalie.schellack@smu.ac.za

Keywords: irritable bowel syndrome, spastic colon, IBS, IBS-C, IBS-D, chronic constipation, diarrhoea, abdominal pain, pathogenesis, diagnosis, therapy

Abstract

Irritable bowel syndrome (IBS) (also known as spastic colon) is a chronic condition that affects the large intestine (colon) and seems to be more prevalent among women. It is often associated with cramping, abdominal pain, bloating, flatulence, diarrhoea and/or constipation (depending on which sub-type the patient suffers from). Certain alarm features (e.g. rectal bleeding, nocturnal symptoms and family history of colorectal cancer or inflammatory bowel disease) should be ruled out first before IBS can be diagnosed, following an approach of exclusion.

The exact pathogenesis of IBS is not clear, but psychosocial factors, abnormal gastrointestinal motility and visceral hypersensitivity play an important role. Psychological distress such as anxiety and depression have also been linked to IBS and are potentially exacerbated by the patients’ impaired quality of life whilst living with the condition.

Treatment of IBS is directed towards encouraging physical exercise, advising the patient on dietary modification, providing psychosocial support and alleviating the patients’ symptoms.

Introduction

Irritable bowel syndrome is a functional bowel disorder characterised by the presence of recurrent abdominal pain associated with change in bowel habit whether in the form of constipation (IBS-C) or diarrhoea (IBS-D), or those who have both diarrhoea and constipation known as mixed-stool-pattern IBS (IBS-M). Sensations of discomfort, distension (bloating), and disordered defecation are commonly associated features. IBS is one of the most widely recognised functional bowel disorders, with more than 10 to 20% of the global adult population reporting symptoms, with IBS being approximately 1.5 times more common in women than in men, and being more commonly diagnosed in patients younger than 50 years of age. The prevalence and the poor response to established therapies for IBS have resulted in a substantial economic impact and although there is no excess mortality associated with IBS, this disorder can have a serious debilitating effect on the patient and significantly impact on their quality of life.

The World Gastroenterology Organisation (2015) distinguishes IBS as the following:

- It is not known to be associated with an increased risk for the development of cancer or inflammatory bowel disease.
- Other symptomatic gastrointestinal disorders (e.g. gastroesophageal reflux disease, dyspepsia, and functional constipation) may occur which can be confused with IBS symptoms.
- The condition usually causes long-term symptoms which may occur in episodes often associated with food intake and, characteristically, with defecation. This interferes with daily life and social functioning in many patients. Symptoms sometimes seem to develop as a consequence of an intestinal infection (postinfectious IBS) or to be precipitated by major life events, or occur during a period of considerable stress.

Classification

The diagnosis of IBS is based mainly on symptom assessment. It is very important to obtain a precise and accurate patient history that includes pain, bowel habits, familial interrelationships, medication and dietary history to ensure diagnostic and therapeutic efficacy. The Manning and Rome III criteria (Table I) are commonly used for the diagnosis of IBS. IBS can be sub-classified on the basis of the patient’s stool characteristics, as defined by the Bristol Stool Scale (Figure 1). Before diagnosing a patient with IBS, healthcare professionals should exclude the following “red flag” symptoms: onset of symptoms above the age of 50 years, a short history of symptoms, nocturnal symptoms, weight loss, rectal bleeding, anaemia, and the presence of markers for inflammation or infections. Precipitating factors such as post-infectious (PI-IBS), food-induced (meal-induced) or stress-related, should also be
ruled out before the diagnosis of IBS. The division of IBS patients into subtypes is useful for clinical practice and symptomatic treatment, but it is common for IBS patients to switch from one subtype to another over time. These patients are known as “alternators”. More than 75% of IBS patients change to either of the other two subtypes at least once over a one-year period.

Alterations in stool form are associated with numerous gastrointestinal symptoms and conditions. The Bristol stool chart is used to classify stools into seven different types which helps patients describe their stool consistency.

The majority of gastroenterologists believe that a symptom-based diagnosis, such as that based on the Rome III criteria, without red flags, is enough for the diagnosis of IBS and that no further investigations are needed. Laboratory studies do not aid diagnosis in patients who meet the Rome criteria who have no other signs or symptoms suggestive of another aetiology. If symptoms are inconclusive, examples of tests that can be conducted include full blood count, erythrocyte sedimentation rate or plasma viscosity, C-reactive protein, and antibody testing for coeliac disease or tissue transglutaminase. Additional studies, such as ultrasound, sigmoidoscopy, colonoscopy or barium enema, thyroid function test, faecal ova and parasite tests, faecal occult blood, and a hydrogen breath test, should be undertaken only when there are other objective abnormalities such as coeliac and inflammatory bowel disease (IBDs) or cancer.

Pathogenesis

The pathogenesis and pathophysiology of IBS is complex and still incompletely known. Potential pathogenetic factors include genes, infectious events, psychological symptoms and other loosely defined environmental factors. Both alterations at the central

Table I. Criteria for the diagnosis of irritable bowel syndrome

<table>
<thead>
<tr>
<th>Rome III criteria</th>
<th>Manning criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recurrent abdominal pain or discomfort with onset at least six months prior to diagnosis, associated with two or more of the following, at least three days per month in the last three months</td>
<td>Primary criteria</td>
</tr>
<tr>
<td>Improvement with defecation</td>
<td>Persistence or recurrence of the following symptoms for at least three months: abdominal pain/discomfort, relieved with bowel movement (BM) or associated with a change in the frequency or consistency of stool</td>
</tr>
<tr>
<td>Onset associated with change in frequency of stool</td>
<td>Additional criteria</td>
</tr>
<tr>
<td>Onset associated with change in form (appearance) of stool</td>
<td></td>
</tr>
</tbody>
</table>

Table II. Subtyping of irritable bowel syndrome

<table>
<thead>
<tr>
<th>Sub -type</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBS with diarrhoea (IBS-D)</td>
<td>Loose stools &gt; 25% of the time and hard stools &lt; 25% of the time</td>
</tr>
<tr>
<td>IBS with constipation (IBS-C)</td>
<td>Hard stools &gt; 25% of the time and loose stools &lt; 25% of the time</td>
</tr>
<tr>
<td>IBS with mixed bowel habits or cyclic pattern (IBS-M)</td>
<td>Both hard and soft stools &gt; 25% of the time</td>
</tr>
</tbody>
</table>

Figure 1. The Bristol stool chart

Figure 2. Pathophysiology of irritable bowel syndrome
and peripheral level are thought to contribute to the symptoms of IBS, including psychosocial factors, abnormal gastrointestinal motility and secretion, and visceral hypersensitivity (Figure 2).12

IBS is viewed as a disorder of dysregulation of the so-called brain-gut axis, involving abnormal function in the enteric, autonomic and/or central nervous systems, with peripheral abnormalities probably dominating in some patients and disturbed central processing of signals from the periphery in others. Lines of evidence also suggest that inflammation within the gastrointestinal tract may be of great importance in at least subgroups of IBS patients.13

The integration of visceral reflexes, the afferent stimuli through hypothalamic stimulate effrent neural fibres which, through the peripheral nervous system (PNS), stimulate or inhibit the contraction of smooth muscle fibres and the secretion of enterocytes in the gastrointestinal tract modifying the gut motility and secretion.13 Enhanced gut transit is seen in some patients with diarrhoea-predominant IBS, and decreased gut transit is seen in some patients with constipation-predominant IBS.9

Psychological stress and emotional events, such as physical or sexual abuse, can result in gastrointestinal (GI) symptoms in healthy subjects, but they affect patients with IBS to a larger degree. The common psychological symptoms associated with IBS are depression, somatisation, anxiety, hostility, phobia, and paranoia. In addition, substantial evidence supports a key role for stress in the pathophysiology of gut motor dysfunction and increased sensitivity in patients with IBS.14

Acute, transient gastrointestinal infection is often associated with a syndrome that often meets diagnostic criteria for the diagnosis of IBS especially when the causative organisms are Campylobacter jejuni or Salmonella.15,16 The inflammatory response may be associated with activating enterochromaffin cells to produce 5-hydroxytryptamine (5-HT) and CD3 cells to produce cytokines, which in turn leads to enhanced motility, increased intestinal permeability, and lowered visceral sensation thresholds.17

Diet plays a significant role in our bodies; patients with IBS believe that their diet has a significant influence on their symptoms and they are interested in finding out which foods they should avoid.18,19 Many IBS patients report specific foods as triggers, most commonly implicating milk and dairy products, wheat products, onion, peas and beans, hot spices, cabbage, certain meats, smoked products, fried food and caffeine as the offending foods. Common symptoms of dietary fructose and lactose intolerance include bloating, flatulence, pain, and diarrhoea which have also been found in patients with unexplained dyspepsia or functional bowel disorders such as IBS. The reaction of IBS patients to certain food items has been attributed to a number of short-chain carbohydrates that are poorly absorbed so that a significant portion of the ingested carbohydrates enters the distal small bowel and colon. Once there they increase the osmotic pressure and provide a substrate for bacterial fermentation with the production of gas, distension of the large intestine and abdominal discomfort or pain.

Treatment of IBS includes physical exercise, psychosocial support, dietary modification and symptomatic pharmacological treatment aimed at the management of abdominal pain, constipation and diarrhoea to improve quality of life.

Management

Dietary modification

Patients can initially follow an approach of dietary exclusion whereby they would restrict certain foods that are known to exacerbate symptoms of IBS, and then gradually reintroduce them into their diet.20 It is generally advisable to eat regular meals, eat slowly and paced and to exclude certain foods.21 Even though the evidence is limited, fatty foods, caffeine, alcohol, carbonated drinks, gluten and fermentable carbohydrates have been associated with patient discomfort.22

A diet rich in fibre can be beneficial to relieve constipation associated with IBS-C, though the patient could experience temporary increased flatus and abdominal distention.23

Probiotics

Probiotics, in particular the Lactobacillus and Bifidobacterium species, are potentially beneficial to patients suffering from IBS either directly (through amplifying beneficial microbiota and reducing pathogens) or indirectly (by reducing inflammation and colonic fermentation).

The composition of colonic microbiota is disturbed in IBS patients, especially following bacterial gastroenteritis. Probiotics can restore the balance of live microorganisms, alter colonic fermentation, enhance gut barrier function, reduce mucosal permeability and visceral hypersensitivity, decrease hypercontractility and play an immunomodulating role by promoting anti-inflammatory and inhibiting proinflammatory cytokines. Probiotics are generally well tolerated without significant side-effects.20,24

Natural remedies

Remedies such as Chinese herbal medicine, acupuncture, meditation and reflexology have been explored for the treatment of IBS, but failed to provide satisfactory supporting evidence. Peppermint oil (Colpermin® capsules) can be used as a fairly safe, natural smooth muscle relaxant to improve the symptoms of IBS (Wu, 2010). Various studies proved the phytotherapeutic preparation, Iberogast®, to be a promising spasmyloytic aid for IBS.25,26

Antispasmodic drugs

Antispasmodic agents have been used for many years in the treatment of IBS.27 The rationale behind using these agents is to alleviate the postprandial abdominal pain likely caused by colonic smooth muscle spasm (hence the term “spastic colon”).22,27 Anticholinergic agents such as dicyclomine (Asic®), hyoscine and mebeverine (Bevispas®) can be used to provide short-term relief in the management of IBS27,28,29 although their use may be limited.
by side-effects including dry mouth, visual disturbances, urinary retention and constipation.22,26,28

**Anti-diarrhoeal agents**

Opioid analogues such as loperamide (Imodium®) and diphenoxylate (in combination with atropine e.g. Lomotil®) are commonly used as anti-diarrhoeal medication in the treatment of IBS-D.28,30 They can be taken before meals to decrease stool frequency and improve stool consistency.22 The dose should be titrated, targeted at achieving a stool with desirable consistency.31

**Laxatives**

Various bulk-forming (methylcellulose) and osmotic laxatives (polyethylene glycol, lactulose, magnesium hydroxide and sorbitol) can be used to soften stools and increase stool frequency for patients suffering from IBS-C.22,28

**Antidepressants**

Tricyclic antidepressants (TCAs) and selective serotonin reuptake inhibitors (SSRIs) proved to be beneficial to gastrointestinal motility in the treatment of IBS.41 Both agents possess moderate affinity for 5-hydroxytryptamine (5-HT,) receptors which is likely related to increased gastrointestinal transit time.32

TCAs (mostly amitriptyline) are commonly prescribed in lower, non-psychiatric doses23,32 which do not affect the patients’ mood, but rather act centrally to exert an action on gastrointestinal motility and secretion and to down-regulate visceral pain sensitivity.23,28,30,32

**Serotonin-receptor modulators**

Serotonin receptor modulators exert their action on the enteric nervous system in the gastrointestinal tract. Tegaserod (Zelnorm®), a partial 5-HT agonist, was previously used to increase peristalsis and therefore accelerate gastrointestinal motility which led to effective alleviation of constipation associated with IBS-C.33,34 The drug was, however, withdrawn from the market in 2007 due to evidence suggesting possible cardiotoxicity and can now only be obtained for restricted use.26,34

Alosetron, a potent 5-HT antagonist, has the opposite effect of tegaserod. Alosetron blocks the afferent neurons resulting in significantly decreased gastrointestinal motility (making it useful

**Figure 3:** Suggested step-wise IBS management approach4

[HT: hydroxytryptamine; IBS: irritable bowel syndrome; OTC: over-the-counter]
for IBS-D) and abdominal pain. Aloe vera is not yet available on the South African market.

Other newer serotonin receptor modulators including renzapride, cilansetron and ramosetron are currently under development.

Conclusion

IBS is a common chronic disorder of which the aetiology is not completely understood. Although it is not a life-threatening disease, it does have a significant impact on patients’ lives. It is usually diagnosed by the exclusion of other serious illnesses which present with similar symptoms to IBS. The Manning and Rome III criteria classify IBS into subtypes based on the patient’s stool characteristics.

A patient’s psychological wellbeing and diet have a direct impact on IBS. The treatment of IBS is directed towards dietary restriction, psychotherapy and symptomatic relief mainly by the use of natural medicines, spasmylic agents, anti-diarrhoeal medicines, laxatives and antidepressants to improve the patient’s quality of life.

References